COVER SHEET
Public Review Draft – March 2004

Title of Environmental Review:	Environmental Assessment of a National Marine Fisheries Service (NMFS) Action to Issue Research/Enhancement Permit 1250 to the Columbia River Inter-tribal Fish Commission (CRITFC) under Section 10(a) (1) (A) of the Endangered Species Act
Evolutionarily Significant Units:	Snake River Spring/Summer Chinook Salmon
Responsible Agency and Official:	D. Robert Lohn NOAA – National Marine Fisheries Service 7600 Sand Point Way N.E. Seattle, WA 98115
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Legal Mandate:	Endangered Species Act of 1973, as amended and implemented – 50 CFR Part 223
Location of Proposed Activities:	Idaho, Snake River Basin, South Fork Salmon River subbasin
Activity Considered:	NMFS' action of issuing a permit to CRITFC for the direct take of ESA-listed anadromous fish under the jurisdiction of NMFS associated with proposed artificial propagation and research activities affecting summer chinook salmon in Johnson Creek, tributary to the East Fork South Fork Salmon River, in Idaho.

Table of Contents

1.0 Purpose Of and Need for the Proposed Action

1.1 Background

NOAA's National Marine Fisheries Service (NMFS) is the lead agency responsible for administering the ESA as it relates to listed salmon and steelhead. Actions which may affect listed species are reviewed by NMFS under section 7 or section 10 of the ESA or under section 4(d), which can be used to limit the take prohibition under section 9. Under section 10(a)(1)(A) of the Endangered Species Act (ESA), non-Federal entities may apply for permits from NMFS to take ESA-listed species under the jurisdiction of NMFS if such taking is for scientific purposes or to enhance the propagation or survival of the affected species.

On March 23, 1998, the Columbia River Inter-Tribal Fish Commission (CRITFC) (Lothrup 1998) submitted a section 10 permit application to artificially propagate summer chinook salmon (*Oncorhynchus tshawytscha*) in the South Fork Salmon River Subbasin. The proposal is titled "Johnson Creek Artificial Propagation Enhancement" (JCAPE); activities described in the proposal would be conducted by the Nez Perce Tribe, in cooperation with CRITFC. Snake River spring/summer chinook were listed as threatened under the Endangered Species Act (ESA) on December 28, 1993 (58 FR 68543). The JCAPE project would be funded by Bonneville Power Administration (BPA), and on April 17, 1998, BPA requested CRITFC's section 10 permit application be used to initiate section 7 consultation (Beraud 1998). NMFS concurred with BPA's request on May 7, 1998 (Smith 1998).

ESA section 10 (a)(1)(A) permit number 1147 was issued to CRITFC on July 11, 1998, for a one year period, expiring at the end of June 1999 (NMFS 1998). Pursuant to permit 1147, listed chinook salmon brood stock were trapped and spawned by the Nez Perce Tribe (NPT), acting under the CRITFC permit. The resultant progeny were reared to smolts and released in March 2000. CRITFC/NPT submitted a draft application to extend permit 1147 in March, 1999; however, the application lacked a monitoring and evaluation plan and benefit/risk assessment. The spawning run to Johnson Creek in 1999 was predicted to fall below the number that could provide brood stock. Therefore, no action was taken to extend the permit for broodstock collection in 1999. Drafts of the required monitoring and evaluation plan and benefit/risk assessment were exchanged between NMFS and CRITFC in 1999 and a complete application was received by NMFS on March 15, 2000. NMFS now proposes to issue a section 10(a)(1)(A) permit (permit number 1250) to CRITFC, with NPT acting as their agent, to conduct the JCAPE project.

The following plans and documents have been developed by CRITFC, NPT, and BPA for the JCAPE project and are included in the application: (1) long-term broodstock management plan, following the Hatchery and Genetic Management Plan (HGMP) format; (2) Benefit/Risk Assessment; (3) Monitoring and Evaluation Plan; (4) Johnson Creek weir protocol; and (5) Environmental Assessment including adult collection, spawning, rearing, acclimation, and release of summer chinook salmon.

Permit 1250 would address the affects of the JCAPE artificial propagation program. Monitoring and evaluation actions which are conducted on the natural population of Johnson Creek are addressed by ESA permit 1134, which was renewed on June 30, 2003, and extends through 2007.

NMFS seeks to consider, through NEPA analysis, the effects of the pending action on the natural and physical environment and the relationship of people with that environment. NMFS is also required to review compliance of ESA actions with other applicable laws and regulations. The NEPA analysis provides an opportunity to consider, for example, how the action may affect conservation of non-listed species, socioeconomic objectives which seek to balance conservation with wise use of affected resources, and other legal and policy mandates. Of particular concern is whether pending actions are consistent with treaties and the associated federal treaty trust responsibilities. The United States has a unique relationship with tribal governments as set forth in the Constitution, treaties, statutes, and Executive orders. This body of statutes, treaties, and policies, together with Federal court rulings which interpret them, is commonly spoken of as "Treaty Trust Doctrine." As stated in Secretarial Order 3206 ("American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act"), NMFS is "... to ensure that Indian tribes do not bear a disproportionate burden for the conservation of listed species ...." With regard to fisheries and resource management, the Secretarial Order encourages development of cooperative relationships with the Tribes, the creation of government-to-government partnerships, and cooperative assistance to intertribal organizations to carry out resource management responsibilities.

1.2 Description of the Proposed Action

NMFS proposes to issue ESA section 10(a)(1)(A) research/enhancement permit 1250 to CRITFC for artificial propagation activities. The artificial propagation action proposed by CRITFC includes collecting and spawning adult threatened Snake River spring/summer chinook salmon, using the resulting progeny in scientific research, enhancing the propagation or survival of the listed population, and subsequently releasing juveniles which are the progeny of listed fish into the wild. NPT, acting under the permit requested by CRITFC, also proposes to install and operate a weir, a trap, and holding facilities for collection of listed Snake River spring/summer chinook salmon adults from Johnson Creek to enhance the propagation and conduct research on the listed species of salmon.

Three alternatives are considered in this EA: (1) NMFS does not issue a section 10 permit for the proposed activities; (2) NMFS issues a permit for the JCAPE supplementation program allowing collection of up to 40 pairs of chinook salmon for broodstock and production of up to 100,000 smolts annually; and (3) NMFS issues a permit for the JCAPE supplementation program allowing collection of up to 132 pairs of chinook salmon for broodstock and production of up to 310,000 smolts annually. (Section 2.0, Alternatives Including the Proposed Action).

The proposed actions are expected to affect only Snake River spring/summer chinook salmon, listed as threatened under the ESA. However, listed Snake River Basin steelhead, Snake River

sockeye salmon, and Snake River fall chinook salmon may be present in some of the waters that are affected by the permitted activities.

1.3 Purpose of and Need for the Action

The purpose of the proposed action is to conduct artificial propagation and research activities to enhance the propagation and survival of the listed population of naturally spawning summer chinook salmon in Johnson Creek. The operation of the proposed supplementation project would be consistent with, and would take place within the greater context of regional and sub-basin salmon recovery plans. The JCAPE project includes monitoring guidelines to assess the success of the program and to ensure that the artificial propagation and research activities would not prevent the survival and recovery of ESA-listed salmon and steelhead.

The need for the proposed action is to conserve and enhance natural populations while evaluating the impacts of supplementation on the natural population. In addition to restoring a viable, naturally-reproducing population of chinook salmon, the program is expected to ultimately contribute to meeting tribal trust responsibilities, providing tribal ceremonial and subsistence needs, and providing recreational fishery opportunities.

1.4 Action Area

The proposed JCAPE project would be located on Johnson Creek, a tributary of the East Fork South Fork Salmon River, in Valley County, Idaho (Figure 1).

The Snake River basin, including its tributaries, covers 695,000 square miles in six states. The Snake River is the largest tributary to the Columbia River and historically was the most important producer of anadromous fish in the entire Columbia basin (NMFS 1995). The Snake River is estimated to have produced between 39 and 45 percent of all Columbia River spring and summer chinook, 55 percent of summer steelhead and substantial numbers of fall chinook, sockeye, and coho salmon. The Salmon River, tributary to the Snake, is the largest undammed river in the continental United States. The South Fork Salmon River is reputed to be the single most important drainage for Snake River Basin summer chinook, and Johnson Creek is one of the most important spawning and rearing areas in the South Fork drainage.

Johnson Creek begins near Deadwood Summit at an elevation of about 7,200 feet and flows northward approximately 35 miles to its confluence with the East Fork South Fork Salmon River near the community of Yellowpine at an elevation of about 4,500 feet. The sub-basin area is 153,800 acres, primarily National Forest land with some private inholdings. Over half of the sub-basin is inventoried roadless area. Although there are several hundred mining claims in the sub-basin, reflecting a long history of mining exploration and development, none are currently active in the Johnson Creek sub-basin, though there is some activity in the East Fork South Fork drainage; there are probably some number of “legacy affects” from old placer mines and ore dumps, representing the marks of old mineral extraction activities. The predominant vegetation is mixed conifer forest with interspersed grass and sedge meadows. No Federally listed plant species are reported, and few exotic weeds are noted (USDA 2000). The upper one-third of the

Johnson Creek sub-basin has extensive meadow areas, the middle one-third is characterized by steep and cascading sections, and the lower one-third of the sub-basin is lower gradient and located in a wide-bottomed valley. Most of the historic chinook salmon spawning and rearing has been observed in this lower section, and it is the location for the proposed JCAPE project. The action area includes designated critical habitat for threatened Snake River spring/summer chinook salmon.

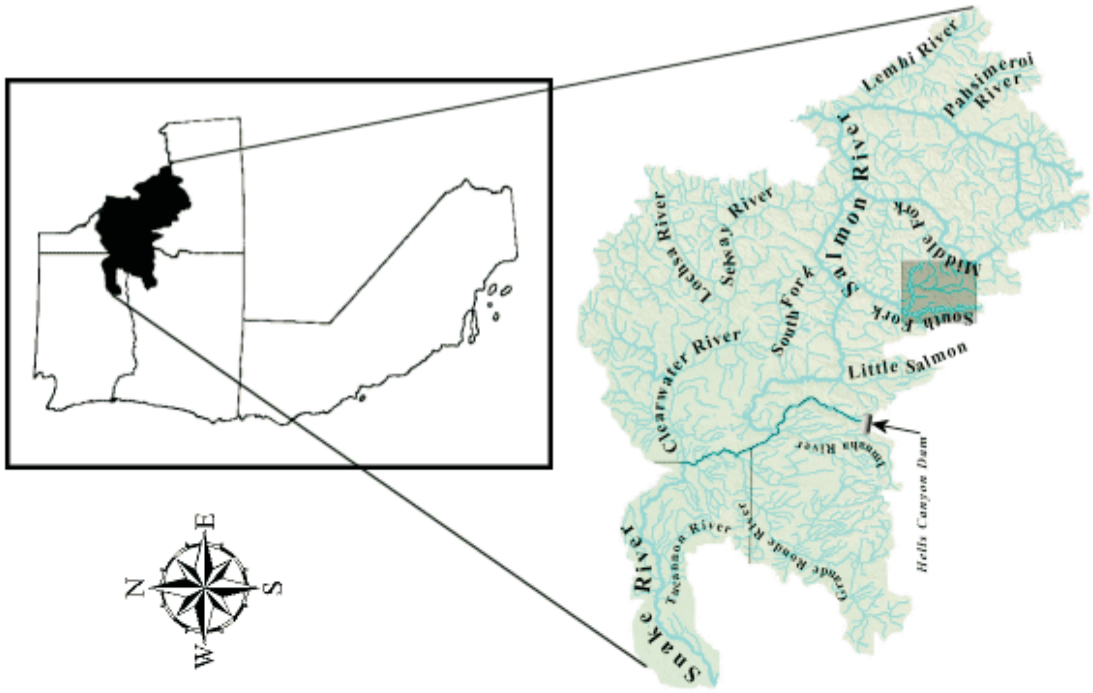
1.5 Scope of the Action

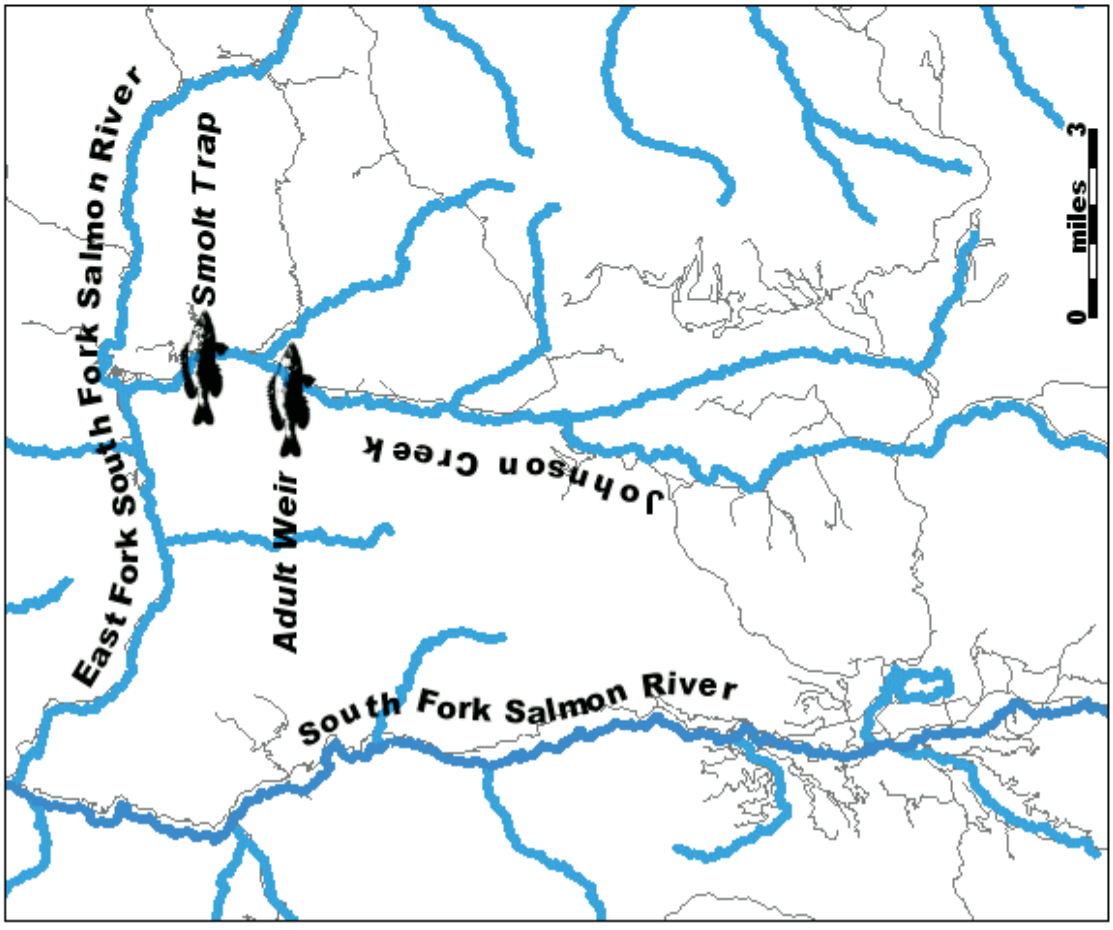
The scope of the action considered here includes only the JCAPE project and its effects on the listed species within the Snake River Basin and more specifically the South Fork Salmon River basin and the Johnson Creek sub-basin.

1.6 Relationship to Other Plans and Policies

The Proposed Action analyzed in this EA relates to other plans and policies regarding the management and restoration of anadromous fish resources in the Pacific Northwest. The discussion above, in subsection 1.1, describes the policy and decision foundation of the project. The concept of utilizing artificial supplementation as a strategy to recover depleted salmon populations is described in the Basinwide Salmon Recovery Strategy, which was developed by the Federal government to restore ESA-listed salmon and steelhead throughout the Columbia River basin (Federal Caucus 2000). The strategy outlines specific actions to be taken by the Federal government and proposes additional actions for tribal, state, and local governments. These actions include improving hatcheries, limiting salmon harvest, and restoring salmon habitat.

In addition, the Proposed Action is consistent with on-going ESA recovery planning. Recovery plans are being developed in most sub-basins in the Columbia River system. These recovery plans will contain: (1) measurable goals for delisting, (2) a comprehensive list of the actions necessary to achieve delisting goals, and (3) an estimate of the cost and time required to carry out those actions. All factors that have been identified as leading to the decline of ESA-listed species will be addressed in these recovery plans. For ESA-listed salmon and steelhead, these factors include hydroelectric operations, harvest, habitat use, and artificial propagation. The permit application describes a conservation plan designed to promote recovery of the listed salmon population in Johnson Creek.





Enhancement program activities.

2.0 Alternatives including the Proposed Action

The proposed action and two alternatives considered in this EA are: (1) no action (i.e., no permit issued), (2) to issue the permit with conditions that limit collection of broodstock to 40 pairs (80 fish) of listed chinook salmon and production of listed chinook smolts to 100,000 annually (proposed action), and (3) to issue the permit with conditions that allow collection of up to 232 listed salmon (131 pairs) for broodstock and production of up to 310,068 smolts annually. The following summary describes major aspects of the proposed action and alternatives.

2.1 No Action Alternative - Issue No Permit

Under the No Action alternative, NMFS would not issue an ESA section 10(a)(1)(A) permit authorizing takes of ESA-listed species associated with the proposed activities. This alternative would effectively prohibit the collection of listed fish for broodstock and using artificial production for supplementation of the population. The No Action alternative would terminate further research on the effects of an artificial supplementation program on the listed population in the proposed action area. Research and monitoring of the natural population would continue under a separate permit (permit 1134; see subsection 1.1, above).

2.2 Alternative 2 (Proposed Action) - Issue a Permit for Annual Production of 100,000 Smolts

The proposed action is to issue a permit under section 10 (a) (1) (A) of the ESA based on the application, including attachments, submitted by CRITFC as modified by the conditions that NMFS may require as being necessary and appropriate. The application, including the attached HGMP, benefit/risk assessment, and monitoring and evaluation plan submitted by CRITFC, reflects the adoption of risk-averse protocols for artificial propagation of listed species which incorporate current science on management of hatchery facilities and genetic impacts of artificial propagation. This alternative adjusts the scale of the action proposed by CRITFC, but remains consistent with the purpose and need of the project. The action is to issue a permit for 100,000 smolts annually with no new facility construction. NMFS' conditions would ensure that the direct take of ESA-listed anadromous fish would be for the propagation and enhancement of the listed populations and research, and would not appreciably reduce the likelihood of the survival and recovery of the species in the wild.

2.2.1 Johnson Creek Artificial Propagation Enhancement Program (JCAPE)

The action in the permit proposed to be issued by NMFS would occur within the Johnson Creek sub-basin, tributary to the East Fork, South Fork Salmon River, and would generally consist of the following measures:

(1) Capture, count, and collect biological information on, all adult and jack spring/summer chinook salmon of both natural and hatchery origin returning to the Johnson Creek weir and traps annually from 2004 through 2008.

(2) Retain up to 40 pairs of the captured natural origin unmarked adult spring/summer chinook salmon for hatchery broodstock, according to a sliding-scale protocol as detailed in the permit. Artificially spawn the broodstock following best management practices, taking genetic and demographic concerns into account.

(3) Utilize mating and rearing protocols to maximize the effective spawning population size and avoid the risks of artificial selection in the hatchery component as specified in an HGMP approved by NMFS.

(4) Tag all adult salmon trapped at Johnson Creek to track all adults used as broodstock or released for natural spawning.

(5) Release hatchery-produced supplementation returnees and natural returnees surplus to hatchery needs upstream of the hatchery weir. Following protocols outlined in the HGMP, manage the release and retention of adult returns to the facility.

(6) Inject the adult Snake River spring/summer chinook salmon which are trapped and enumerated, whether retained for broodstock or released for natural spawning, with erythromycin to control bacterial kidney disease.

(7) Rear up to 100,000 progeny of the listed spawners to smolt stage annually. Release the smolts resulting from eggs spawned from 2004 through 2008, in the spring of 2006 through 2010. Smolts would be returned to Johnson Creek by truck and directly released to the stream, based on physiological condition of the fish and appropriate water temperatures in March of each year.

(8) The schedule for retention and release of listed, natural-origin and hatchery broodstock outlined in items (3), (4), and (5), above, is based on at least 160 adult natural-origin Snake River spring/summer chinook returnees to the hatchery weir. In any year that fewer than 160 adult salmon are predicted to return, no more than 50 percent of the natural origin females would be collected for broodstock. In the case that fewer than 100 adult salmon are predicted to return, the CRITFC and NPT would consult further with NMFS at the earliest practical date to evaluate the predicted return and develop broodstock collection protocols which would best benefit the listed species.

(9) Conduct the monitoring and evaluation activities outlined in the attachment to the application, which are designed to assess the success of the project in meeting its goals and to detect the impacts on the listed species from the project.

The weir would only be in place during the time adult chinook return to the project area. The weir intercepts all fish attempting to pass. Because the weir has no permanent structure in the stream, and installation requires workers to wade and carry the weir components into the stream, it cannot be installed until after high spring flows. Generally the weir can be installed between

June 15 and July 1. Any adult steelhead or bull trout that are encountered are immediately released upstream or downstream from the weir. Juvenile salmonids pass the weir without impediment. The temporary weir and trap is described in the application.

At the proposed action level of collecting up to 40 pairs of adult salmon for broodstock and producing 100,000 smolts annually, most project activities would take place in existing facilities. Adults would be collected at a temporary weir and trap on Johnson Creek. Adults selected for broodstock would be transported to the existing South Fork Salmon River trap where they would be held and spawned in the same facilities used for the South Fork summer chinook salmon program. The resultant eggs would be transported to McCall Fish Hatchery where they would be incubated, hatched, and reared to smolt size before being returned to Johnson Creek and released. The South Fork adult holding and spawning facilities are designed to trap and sort the entire South Fork Salmon River adult return and collect sufficient eggs to support the 1 million smolt rearing capacity of McCall Hatchery. At the proposed level of 100,000 smolts, the JCAPE project would be accommodated with a small amount of rebuilding and adapting existing facilities for a 10 percent increase in production.

The non-discretionary conditions NMFS would include in the permit would ensure that annual take of endangered Snake River sockeye salmon, Snake River spring/summer and fall chinook salmon, and Snake River Basin steelhead would not appreciably reduce the likelihood of survival and recovery of these species in the wild. Specifically, NMFS' conditions are designed to minimize ESA-listed fish mortalities incidental to the collecting and spawning of adult Snake River spring/summer chinook salmon, using the resulting progeny in scientific research, enhancing the propagation or survival of the listed population, and subsequently releasing juveniles which are the progeny of listed fish into the wild. Of primary concern in the development of the conditions for the proposed permit is the necessity to take special measures to avoid adverse impacts from artificial propagation and to preserve the genetic and life history characteristics of the listed species.

2.3 Alternative 3 - Issue a Permit for Annual Production of 310,068 Smolts

Under Alternative 3, the permit issued pursuant to section 10 (a) (1) (A) would authorize the program proposed by CRITFC in the application for collection of 131 pairs (232 fish) of adult chinook salmon annually from Johnson Creek and production of approximately 310,068 smolts. The difference between the proposed action and alternative 3 is primarily the need for expanding trapping facilities to hold and spawn the additional adults and development of additional hatchery facilities to accommodate the larger number of smolts produced under alternative 2. The provisions of the proposed action relative to fish health and adoption of prudent and risk-averse fish husbandry protocols would not change.

At the production level examined as alternative 3, the program would require sufficient trapping and holding facilities to be built on Johnson Creek to trap and sort the entire returning run of adult salmon and to retain 232 adult chinook salmon for broodstock. The broodstock would be held until maturity and artificially spawned. The resultant fertilized eggs would be transported to

McCall Fish hatchery where they would be incubated, hatched, and approximately 310,000 would be reared in the hatchery and returned to Johnson Creek to be released as smolts. The proposed release strategy would require an acclimation pond to be built within the flood plain of Johnson Creek. Operation of the JCAPE program at the level of 310,000 smolts would require construction of new adult trapping, holding and spawning facilities on Johnson Creek, and reconstruction of McCall Fish hatchery to provide incubation space for approximately 535,000 salmon eggs; vats or small raceways for early rearing of 400,000 fry; and large raceway or pond capacity for rearing 310,000 chinook to smolt size. McCall Hatchery was designed and built for annual production of 1 million chinook salmon smolts, and this proposal would require 31 percent additional space for each life stage and place increased demand on the limited water supply.

3.0 Affected Environment

The proposed action would potentially affect the physical, biological, social, and economic resources within the proposed action area. Below is a summary of the major components of the environment that would be affected and the current baseline condition.

3.1 Riparian Habitat

The upper Johnson Creek sub-basin largely consists of lodgepole pine and subalpine fir forest interspersed with meadows vegetated by grasses, sedges, and willows, while the middle and lower sections are in Douglas-fir and Ponderosa pine forests with birch, alder, cottonwood, and willow in the riparian areas. There has been extensive grazing in the past, as well as mining activity and forest roads which parallel and cross some stream segments. Most of the sub-basin is managed by the United States Forest Service (USFS), and the entire area is designated as "Aquatic, Terrestrial and Watershed Restoration" in the Boise National Forest Plan. The sub-basin is considered to be in "properly functioning condition," and riparian and aquatic resources are considered to be at low risk. The geology is primarily granite of the Idaho batholith (USDA 2000).

3.2 Water Quality

While water quality in Johnson Creek has been impacted by a variety of past and present land and water uses, these impacts are not likely a major factor limiting fish production. Water quality in Johnson Creek is slightly impaired by sedimentation from past road building, mining, grazing, and recreational activities, but improving. The Forest Plan management objective is to improve water quality by reducing sources of sediment (USDA 2000). There is no currently active mining, and roads and trails are being maintained to reduce sediment production. Johnson Creek is not on the current state 303(d) list of impaired waters. Grazing was a notable problem in the past but the single cattle allotment in upper Johnson Creek is currently in non-use. Logging activities and road management are designed to reduce sediment activities, and the cessation of most mining activity has had a positive impact on sub-basin recovery (USDA 2000).

Water quality is also affected by the presence of salmonid carcasses in the water, as a result of fish dying after spawning, or dying during unsuccessful upstream migration. Freshwater stream

environments in the Pacific Northwest are generally cold and lacking in dissolved nutrients. Anadromous salmon are a major vector for transporting marine nutrients across ecosystem boundaries (i.e., from marine to freshwater and terrestrial ecosystems). Nutrients and biomass extracted from the decomposing carcasses, eggs, and milt of spawning salmon restore the nutrients of aquatic ecosystems and stimulate biological production (Cederholm *et al.* 1999). Nutrients originating from salmon carcasses are also important to riparian plant growth. Direct consumption of salmon carcasses and secondary consumption of plants and small animals which are supported by carcasses are important sources of nutrition for both aquatic and terrestrial wildlife (Cederholm *et al*. 1999). Although decomposing salmon carcasses may cause temporary and localized appearances of compromised water quality, the nutrient cycling effect is vital to a fully functional ecosystem.

3.3 Anadromous Fish Listed under the ESA

Anadromous salmon reach the headwaters of the Salmon River at elevations more than 6,500 feet above sea level and a distance of over 900 miles from the ocean. Although dams have blocked access to about one-third of the habitat formerly occupied by anadromous fish in the Snake River basin, in excess of 5,000 stream miles, representing approximately two thirds of the historically available spawning and rearing habitat within the Idaho portion of the Snake River basin remains available to anadromous fish (IDFG 1985). Many of the historically most important spawning and rearing areas are located within the largest block of dedicated wilderness in the 48 contiguous states, in Wild and Scenic River corridors and National Recreation Areas, and remain in excellent condition.

Since 1991, NMFS has identified 12 populations of Columbia River Basin salmon and steelhead as requiring protection under the ESA. Four of the listed ESUs originate in the Snake River basin. The populations expected to be impacted by the artificial propagation program covered in this EA and their current listing status are shown below. The ESA-listed population includes some portion of artificially propagated fish as well as the wild/natural populations.

a) Snake River spring/summer chinook salmon, *Oncorhynchus tshawytscha*, threatened, April 22, 1992. This ESU includes tributaries to the Snake River upstream of the Snake and Columbia River's confluence. It includes all natural populations and certain hatchery produced components of spring and summer chinook salmon populations in the mainstem Snake River and the following sub-basins: Tucannon River, Grand Ronde River, Imnaha River, and Salmon River. Spring/summer chinook salmon returning to hatchery programs and supplementation programs in the Clearwater River are excluded, because the native stocks were extirpated by dams and the current populations were reintroduced after the dams were breached (Matthews and Waples 1991).

b) Snake River fall chinook salmon, *Oncorhynchus tshawytscha*, threatened, April 22, 1992. This chinook salmon ESU includes all natural populations of fall-run chinook salmon in the mainstem Snake River and the following sub-basins: Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River. Although not listed, the

Snake River fall chinook stock maintained at Lyons Ferry hatchery is deemed to be included in the ESU and is utilized for rebuilding natural spawning populations (NOAA1998).

c) Snake River sockeye salmon, *Oncorhynchus nerka,* endangered, November 20, 1991. This population remains only in Redfish Lake, at the headwaters of the Salmon River and in a captive broodstock program designed to restore natural spawning populations in redfish Lake and nearby Petit and Alturas Lakes (Flagg and McCauley 1996).

d) Snake River Basin steelhead, *Oncorhynchus mykiss,* threatened, August 18, 1997. This inland steelhead ESU occupies the Snake River Basin of southeast Washington, northeast Oregon, and Idaho (Busby et al. 1996).

Seasonal Distribution/Migration

Spring/Summer Chinook Salmon – Spring chinook salmon destined for the Snake River and tributaries begin entering the Columbia River in late February and early March. Their abundance downstream from Bonneville Dam peaks in April and early May. All chinook salmon passing Bonneville Dam from March through May are counted as spring chinook salmon. All chinook salmon passing Bonneville Dam from June 1 through July 31 are counted as summer chinook salmon. These fish enter the Snake River approximately two weeks after crossing Bonneville Dam and distribute to the tributaries where they spawn in August and September.

The Johnson Creek population of Snake River spring/summer chinook salmon is typical of naturally producing populations in the Snake River Basin. In the years between 1960 and 1995, the estimated spawning population declined from 1,217 adult summer chinook salmon to 23. In the period 1985-1990, the adult-to-adult, spawner replacement ratio was 0.64 (CRITFC 2000). However, according to the NMFS Cumulative Risk Initiative, which developed "A Standardized Quantitative Analysis of Risks Faced by Salmonids in the Columbia River Basin," the annual rate of population change (λ) in Johnson Creek for 1980-1999 is 0.970. The probability of the Johnson Creek population going extinct in 100 years was calculated to be 0.001. This indicates a more stable, but still declining, population than the spawner replacement ratio of 0.64 calculated by CRITFC (2000).

Snake River Fall Chinook Salmon – Fall chinook salmon cross Bonneville Dam after August 1 each year and arrive in Idaho in September and October. In the Snake River, habitat utilized by fall chinook salmon for spawning and early juvenile rearing is very different from that utilized by spring-run and summer-run fish. The latter two forms spawn and rear in higher elevation sections of the Salmon River and other tributary streams, whereas fall chinook salmon use mainstem areas of the Snake River and the lower parts of major tributaries.

Snake River fall-run chinook salmon have traditionally been considered a separate run from Snake River spring or summer chinook salmon based on differences in the timing of adult returns to spawning areas (the Snake River fall chinook salmon adult escapement season is August-

October). Historically, the most important spawning grounds for fall chinook salmon in the Snake River were between Huntington, Oregon (river mile 328) and Auger Falls (river mile 607). The distribution of Snake River fall chinook salmon has been dramatically reduced and now represents only a fraction of its former range. The construction of dams inundated spawning habitat and prevented access to the species' primary production areas when fish passage facilities at the dams proved to be inadequate.

Sockeye Salmon – Sockeye salmon migrate through the lower Columbia River during June and July, with normal peak passage at Bonneville Dam around July 1. Sockeye salmon runs include fish from a remnant Snake River stock listed as endangered since December 1991. Only a very few of these fish (fewer than 20 wild fish in the past 10 years) arrive at spawning areas near the headwaters of the Salmon River in August and September.

Steelhead – Summer steelhead enter the Columbia River from March through October, with most of the run entering from late June through mid-September. The upriver steelhead run has historically been separated into A and B groups which pass Bonneville Dam before and after August 25. Group A steelhead include fish that pass Bonneville Dam from late June through August 25 on their way to tributaries throughout the Columbia and Snake River Basins. Group B steelhead return to the Clearwater and Salmon Rivers in Idaho and pass Bonneville Dam from August 26 through October. Group B steelhead are generally larger than group A steelhead.

Group A and B steelhead cannot be distinguished based on run timing above Bonneville Dam where groups mix as fish seek temporary refuge in cooler tributaries. Steelhead counts at dams above Bonneville surge as mainstem water temperature declines in the fall. Counts peak at John Day, McNary, and the Snake River Dams in September and October. During years of above average September-October flows and lower temperatures, steelhead move readily past lower Snake River Dams during the fall counting period (June-December) and fewer fish are delayed until the spring count period (March-May). Snake River steelhead experience higher Bonneville to Lower Granite Dam survival rates in run years with lower spring count percentages.

3.4 Other Listed Fish Species

One other ESA-listed fish species is expected to be present in the area affected by the proposed action. The Columbia River population segment of bull trout (*Salvelinus confluentus*) was listed as threatened by the United States Fish and Wildlife Service in 1997. Bull trout populations are known to exhibit four distinct life history forms: resident, fluvial, adfluvial, and anadromous. Resident bull trout spend their entire life cycle in the same (or nearby) streams in which they were hatched. Fluvial and adfluvial populations spawn in tributary streams where the young rear from 1 to 4 years before migrating to either a lake (adfluvial) system or a river (fluvial) system, where they grow to maturity. Anadromous fish spawn in tributary streams, with major growth and maturation occurring in salt water.

Migratory bull trout have been restricted or eliminated due to stream habitat alterations, including seasonal or permanent obstructions, detrimental changes in water quality, increased

temperatures, and the alteration of natural stream flow patterns. The disruption of migratory corridors, if severe enough, would result in the loss of migratory life history types and isolate resident forms from interacting with the metapopulation. The Columbia River population segment encompasses a vast geographic area including portions of Idaho, Montana, Oregon, Washington, and British Columbia. Within the Snake River basin, in waters occupied by anadromous salmon and steelhead, bull trout exhibit both the fluvial and resident life histories. Also within the Snake River basin, there is likely some degree of connectivity among the populations in the Snake River and its major tributaries. Bull trout are present, and locally common, in all of the rivers and streams occupied by anadromous fish in the Snake River basin, including the South Fork Salmon River and Johnson Creek.

3.5 Non-listed Fish Species

Approximately 60 other species of fish live in the Snake River and tributaries. About half are native species primarily of the families *Salmonidae, Catastomidae, Cyprinidae* and *Cottidae.* White sturgeon*, Acipenser transmontanus,* occur in the main Snake and Salmon Rivers. The Snake River basin also supports at least 25 introduced species primarily representing *Percidae, Centrarchidae* and *Ictaluridae* (Simpson and Wallace 1978). The only resident species likely to occur in Johnson Creek and be affected by the JCAPE project are native populations of mountain whitefish (*Prosopium williamsoni*), west slope cutthroat trout (*Oncorhynchus clarki*), dace (*Rhinichthys* sp.) and sculpin (*Cottus* sp.) Introduced brook trout (*Salvelinus fontinalis*) are abundant in the upper tributaries of Johnson Creek where they are considered to be a risk to native fish species.

3.6 Terrestrial Organisms

The Johnson Creek sub-basin ranges in elevation from about 4,500 feet above mean sea level at the confluence with the East Fork South Fork to over 9,000 ft above mean sea level on the ridges bounding the basin. Within the varied terrain there are steep, rocky slopes, extensive coniferous forest and large meadow and riparian complexes which support a variety of terrestrial wildlife and plants. The State of Idaho supports 364 known species of vertebrates as reproducing populations, many of which are expected to occur within the upper Salmon River sub-basin. Distribution maps and species lists are contained in "Atlas of Idaho's Wildlife" (Groves et al. 1997). The Johnson Creek sub-basin is bordered on the east by the Frank Church River of No Return Wilderness and would be expected to support many of the same terrestrial species as the Wilderness. Three mammal species and one bird species which may occur in the Johnson Creek sub-basin are listed under the ESA. Gray wolf (*Canis lupus*) occur as an introduced population with an Experimental/Non-essential designation. Canada lynx (*Lynx canadensis*), Northern Idaho ground squirrel (*Spermophilus brunneus brunneus*), and bald eagle *(Haliaeetus leucocephalus*) are listed as threatened (USDA 2000).

3.7 Social and Economic Resources

Salmon are culturally, economically, and symbolically important to the Pacific Northwest. Columbia River chinook salmon populations were at one time acknowledged to be the largest in the world. Prior to the 1960s, the Snake River basin was the most important drainage in the

Columbia system for producing salmon (NMFS 1995). The South Fork Salmon River was the most important sub-basin for the production of summer chinook, and Johnson Creek was an important component of the salmon producing habitat. Native Americans camped, fished, and hunted along Johnson Creek for thousands of years. Salmon were an important aspect of the cultural life and subsistence of the Indian tribes which occupied the Salmon River mountains. Early gold strikes and mining activity at Yellowpine, Stibnite, and Thunder Mountain brought European settlers to the Johnson Creek area in the 1800s. Salmon provided subsistence fishing for the early miners and ranchers and later supported popular recreational fishing and contributed to an active outfitting and guiding industry in the Salmon River country. The cultural importance and former abundance of salmon in the area is memorialized in the names of geographic features and landmarks like the Salmon River, Salmon City, Salmon Falls, and Redfish Lake.

The current depleted status of salmon populations has ended many of the cultural practices and subsistence uses of salmon made by the local Indian tribes and curtailed the economic and cultural benefits of the non-Indian recreational fisheries which the salmon resource formerly supported.

Cultural resources identified by the United States Forest Service in the Johnson Creek sub-basin include prehistoric archeology associated with ancient native American occupation; ranching, associated with early homesteads and grazing activities; transportation, associated with the historic Thunder Mountain road and mining district; and Forest Service history, associated with the Landmark Guard Station and other facilities built by the Civilian Conservation Corps in the 1930s (USDA 2000).

3.8 Environmental Justice

Executive Order 12898 (59 FR 7629) states that Federal agencies shall identify and address, as appropriate "…disproportionately high and adverse human health or environmental effects of [their] programs, policies and activities on minority populations and low-income populations…." While there are many economic, social, and cultural elements which influence the viability and location of such populations and their communities, certainly the development, implementation, and enforcement of environmental laws, regulations, and policies can have impacts. Therefore, Federal agencies, including NMFS, must ensure fair treatment, equal protection, and meaningful involvement for minority populations and low-income populations as they develop and apply the laws under their jurisdiction.

In the analysis area, there are minority and low income populations that this Executive Order could apply to, including Native American Indian tribes. The actions proposed would be primarily conducted by biologists employed by the Nez Perce Tribe, including tribal members. The Shoshone-Bannock tribes also claim hunting and fishing rights within the Johnson Creek sub-basin. The proposed action is designed to restore a depleted salmon population which potentially would support ceremonial and subsistence harvest opportunity specifically for Tribal members, within the context of tribal jurisdiction and authority.

3.9 Tribal Trust Responsibilities and Treaty Rights

As described above, in subsection 1.1, the United States has a unique relationship with tribal governments as set forth in the Constitution, treaties, statutes, and Executive orders. This body of statutes, treaties and policies, together with Federal court rulings which interpret them, is commonly spoken of as "Treaty Trust Doctrine." In keeping with this unique relationship and with the mandates of the Presidential Memorandum on Government to Government relations With Native American Tribal Governments (May 4, 1994, 59 FR 22951) and with Executive Order 13084 (Consultation and Coordination With Indian Tribal Governments; May 19, 1998, 63 FR 27655), NMFS developed and published a section 4(d) rule regarding Tribal resource management on July 10, 2000 (65 FR 42481). Recognizing the unique status of the Treaty Tribes, the Federal Government stated, in the explanatory material accompanying the rule, that the appropriate expression of its trust obligation is a commitment to harmonize its many statutory responsibilities with the tribal exercise of tribal sovereignty, tribal rights, and tribal self determination. While the action considered in this EA is not proposed under section 4(d), the commitment to following trust responsibilities applies.

Dating back to 1855, the Federal government signed treaties with the Nez Perce Tribe, the Shoshone-Bannock Tribes, and the Shoshone-Paiute Tribe reserving rights for traditional tribal uses such as hunting, fishing, and gathering of plant materials on unoccupied public lands and in areas ceded by the tribes to the United States. The Boise National Forest, and specifically the Johnson Creek sub-basin, are traditional foraging areas for these tribes (USDA 2000).

4.0 Environmental Consequences

This section of the assessment evaluates the potential effects of the alternatives on the biological, physical, and human environments. NMFS' determination to issue a permit could affect a variety of natural and human resources. These effects would be primarily indirect effects of permit issuance, occurring as a result of implementation of activities described in the permit application.

4.1 No Action Alternative – Issue No Permit

Under this alternative, no permit for direct take of listed Snake River spring/summer chinook salmon would be issued. There are no ways to implement the program which would avoid taking natural-origin spring/summer chinook salmon, so the implementation of NPT and CRITFC's proposed program would result in the unauthorized take of ESA-listed anadromous fish species. Therefore, the implementation of the program could not proceed without violating the ESA.

4.1.1 Effects on Riparian Habitat

Under the No Action alternative, no additional adverse impacts on riparian habitat would be expected to occur. No temporary or permanent fish handling or propagation facilities would be installed or constructed within the riparian area or flood plain of Johnson Creek. No in-stream activities would occur. The status of the habitat as being in properly functioning condition would not change. No geological impacts would occur. Monitoring and evaluation of the status of the natural population by NPT biologists would still occur as permitted by permit 1134.

4.1.2 Effects on Water Quality

The No Action alternative would not be expected to result in additional adverse impacts on water quality. No temporary or permanent fish handling or propagation facilities would be installed or constructed within the riparian area or flood plain of Johnson Creek. No in-stream activities would occur. No additional salmon carcasses would be added to the stream. Monitoring and evaluation of the status of the natural population by NPT biologists would still occur as permitted by permit 1134.

4.1.3 Effects on Anadromous Fish Listed Under the ESA

Under the No Action alternative, the JCAPE project for artificial propagation and enhancement of the Johnson Creek population would not be authorized. McClure et al. (2001) indicate that the risk of this population becoming extinct in the near future is very small, but the rate of population growth is slightly negative. Unless substantial and long-term changes occur in factors affecting the survival of salmon smolts to adulthood there may be no recovery of this population to viable levels. The Johnson Creek spawning aggregate has averaged fewer than 500 fish for the past 30 years and declined to average only 150 returning adults in the 1990s. Based on the analysis in the draft opinion on permit 1250, this population is near a critical level where risk of loss of genetic variability is possible. Although the population might continue to exist in low and fluctuating numbers for many years, its recovery is far from assured. At extremely low numbers, the loss of genetic and demographic diversity could result in changes to migration patterns and timing – such changes would only be expected to further adversely affect the population's potential for survival and recovery. The design of the JCAPE project is to restore viable and productive abundance which would reduce the demographic risks of very small population sizes and potential for catastrophic losses. The longer term goal is to restore naturally spawning and stable populations with sufficient productivity to support tribal harvest and sustainable recreational fisheries, and the No Action alternative may not meet this goal.

4.1.4 Effects on Other ESA-listed Fish Species

Under the No Action alternative, the other ESA-listed fish species, threatened bull trout, would not benefit from the restored productivity and increased forage supply which could be provided by a restored salmon population. However, under the No Action alternative, bull trout would not be affected by the placement of a weir; the timing of the chinook salmon trapping coincidentally reduces the likelihood of encountering other species, and trap protocols are designed to minimize stress or injury to both the target and incidental catch.

4.1.5 Effects on Non-listed Fish Species

Under the No Action alternative, other resident fish species would receive no benefit from nutrient enrichment. However, salmon populations have been so reduced for so long that the effect of a continued lack of nutrients may not be measurable. Brook trout would continue to be present and would continue to exert some amount of pressure upon indigenous species.

4.1.6 Effects on Terrestrial Organisms

Selection of the No Action alternative would probably leave the Johnson Creek salmon population at the current low and fluctuating numbers. The presence of salmon and the recycling of nutrients which originated in the ocean from salmon carcasses to the inland ecosystem is an important part of a fully functional ecosystem for many species of plants and animals. The terrestrial species which might benefit from the nutrients provided and the ecological functions supported by the restored salmon population would not receive increased benefits. The lack of nutrients and impaired ecological function would likely continue without efforts to restore the salmon population.

4.1.7 Effects on Social and Economic Resources

Selection of the No Action alternative would probably leave the Johnson Creek salmon population at the current low and fluctuating numbers. The risk of extinction or loss of important genetic material could increase. No fish would be available for treaty tribal ceremonial and subsistence use or for recreational fishing opportunity. The social, economic, and cultural benefits of a recovered salmon population would not be available. Should this population become extinct, the existence value would also be lost.

4.1.8 Environmental Justice

Executive Order 12898 (59 FR 7629) directs Federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. The No Action alternative would not be expected to affect human health or the environment of any population located in the action area, nor would any local population share in the potential economic and social benefits of a restored salmon population.

4.1.9 Effects on Treaty Trust Responsibilities

The No Action alternative would not be responsive to the policies and precedents described above in subsection 3.9. The recovery of viable populations of salmon is consistent with Federal trust responsibilities to provide a harmony between statutory mandates and exercise of tribal cultural, subsistence, and other practices. In the absence of compelling reasons to deny the program under consideration, particularly given the tribal role in the implementation of the program in tribally-important lands, not issuing a permit for the program would not facilitate management of treaty trust resources.

4.2 Alternative 2 (Proposed Action) - Issue a Permit for Annual Production of 100,000 Smolts

The proposed action is to issue a Section 10(a)(1)(A) permit for direct take of threatened Snake River spring/summer chinook salmon from Johnson Creek for scientific research and enhancement purposes. The proposed permit 1250 would be valid for a five-year period from July 1, 2004, through the end of 2008 and would permit collection of up to 40 pairs of adult salmon for broodstock and rearing and release of up to 100,000 of their progeny as smolts (see subsection 2.2.1).

4.2.1 Effects on Riparian Habitat

The effects on riparian habitat resulting from issuing a permit which allows implementation of an artificial propagation/supplementation program limited to 100,000 smolts annually would include disturbance of riparian vegetation and habitat during annual installation and operation of a temporary weir and trap (as project personnel walk between the trap and the tender's camp and fish truck loading area), though not likely to an extent to reduce the habitat's properly functioning condition. Only a few acres of riparian habitat in the Johnson Creek sub-basin would be affected. Adverse effects on the physical environment within the riparian area would be slightly higher than under the No Action alternative. Compared to the impacts of the larger production program (Alternative 3), the impacts of the proposed action are expected to be much smaller and temporary. No effects on geology of the area would be expected. Installation of a temporary weir and collection of limited numbers of broodstock has occurred annually for the past 5 years and has not caused concern for the physical environment. Long-term benefits are expected to occur from the increased recycling of marine nutrients through the riparian vegetation and the associated fauna.

4.2.2 Effects on Water quality

Under the Proposed Action, adverse effects on water quality would be slightly higher than under the No Action alternative. Water quality could temporarily be adversely affected by the activities of installing fish trapping and holding facilities. No rearing of smolts or long-term holding is proposed so that fish wastes should not affect water quality. Both beneficial and adverse effects on water quality related to the presence of salmonid carcasses in the water, as a result of dying after spawning, or dying during unsuccessful upstream migration, may occur. The historical amounts of nutrients available to the ecosystem from these carcasses was large, and contributed to the enhancement of many forms of aquatic and terrestrial life, including the organisms juvenile salmon feed upon during rearing. The decomposing carcasses of spawned salmon would have temporary and local beneficial effects on water quality as nutrients are dissolved into the stream and taken up by aquatic and terrestrial flora and fauna. The over-all and long-term effects on water quality resulting from the proposed action are expected to be negligible.

4.2.3 Effects on ESA-listed Anadromous Fish

Under the Proposed Action, effects on listed anadromous fish are expected to be higher than under the No Action alternative. The expected impacts on listed fish species in the Snake River basin from the proposed artificial propagation program would almost entirely be limited to the summer chinook salmon in the Johnson Creek sub-basin. The primary goals of the project are to enhance and restore the naturally-spawning population of summer chinook salmon in Johnson Creek. The only other listed anadromous species expected to occur in the Johnson Creek sub-basin is Snake River Basin steelhead. The native steelhead evolved with the native chinook stock and would be expected to suffer no negative impacts from restoring the chinook population. Listed steelhead and the listed salmon population would be expected to benefit from the recycled marine nutrients added to the ecosystem by the carcasses of spawned-out salmon.

The take of listed broodstock is summarized in the draft biological opinion on the issuance of Permit 1250 (Opinion)(NMFS 2003). During the five-year period covered by the proposed permit, up to 40 pairs (80 fish) of adult chinook would be collected for broodstock and 100,000 smolts would be released annually. The additional artificial production from JCAPE is small, compared to the basin-wide annual artificial propagation production of approximately 25 million hatchery smolts and the estimated natural production capacity of 14 million smolts. The addition of this number of smolts to the Snake River basin would not have measurable impacts beyond the immediate and local effects in the Johnson Creek sub-basin. The operation of the trap and weir is not expected to have a large impact on listed salmonids; trap protocols are designed to minimize stress or injury to target catch. By about June 15, when the weir is installed, salmon and steelhead smolt emigrations from the drainage are complete, adult steelhead have migrated upstream, spawned and dropped back out to the larger rivers (usually by June 1), and the upstream spring migrations of fluvial cutthroat and bull trout are nearly complete.

The JCAPE supplementation program is designed to benefit the listed population of summer chinook in Johnson Creek. The analysis contained in the draft opinion on the issuance of Permit 1250 concludes that the release of 100,000 smolts annually would not exceed the carrying capacity of habitat in Johnson creek and the migration corridor. The return of an average of 340 additional hatchery-produced adults for natural spawning each year would more than offset the collection of 80 naturally-produced adults for hatchery broodstock. If, as the CRITFC application contends, the first-generation hatchery adults are equally successful at reproduction as the natural-origin spawners, the naturally-produced component of the population would be increased in abundance and stabilized at a viable, self-sustaining level. Information gathered from the monitoring and evaluation portions of the project are expected to aid managers in designing supplementation projects and predicting the outcome of artificial supplementation for recovery purposes in other areas.

The draft opinion which analyzes the proposed issuance of permit 1250 concludes that the proposed action would not jeopardize the continued existence or impede the recovery of the listed species which may be affected by the action. Although the population has demonstrated remarkable resilience in the past two years, there are still serious concerns for the stability of the population. The goals of the JCAPE project include preventing extinction and stabilizing the population at a viable level.

4.2.4 Effects on Other ESA-listed Fish Species

Compared to the No Action alternative, the impacts on threatened bull trout from the proposed action are expected to be benign or beneficial. Bull trout are present in Johnson Creek and the East Fork South Fork Salmon River. Chinook salmon are an important component of a normative, fully functional ecosystem for bull trout in tributaries of the Salmon River. Nutrients supplied by decomposing salmon carcasses would be expected to stimulate the production of aquatic invertebrates which are essential forage for juvenile bull trout. Larger bull trout are piscivorous and are expected to utilize the additional salmon eggs, fry, and parr as a forage

resource. Bull trout co-evolved with chinook salmon and restoration of naturally spawning salmon populations would be expected to have a beneficial impact on bull trout populations.

Some incidental take of bull trout is likely to occur during the trapping of adult salmon on their upstream migration and some juvenile bull trout are likely to be taken during monitoring of downstream migrations of salmon smolts. The timing of the chinook salmon trapping coincidentally reduces the likelihood of encountering other species, and trap protocols are designed to minimize stress or injury to both the target and incidental catch. Any bull trout captured in adult or juvenile salmon traps would be released immediately and unharmed back to the stream. The differences in effect on the viability of the bull trout and their ecosystem compared to the No Action alternative, if any, would be expected to be small.

4.2.5 Effects on Non-listed Fish Species

Compared to the No Action alternative, the impacts on non-listed fish species from the proposed action are expected to be benign or beneficial. Other resident fish species would be expected to benefit from the nutrient enrichment and the ecosystem restoration impacts which would occur concurrently with the recovery of the salmon populations. The most common native resident fish species are mountain whitefish, cutthroat trout, dace, and sculpin. Each of these species co-evolved with chinook salmon and would be expected to benefit from the restoration of salmon in their ecosystem. These species all depend on aquatic insects for forage, and the recycling of marine nutrients from spawning salmon would increase insect production. Also, each of these species may utilize salmon eggs and fry as forage under some conditions. Brook trout would also likely benefit to some small degree from increases in salmon numbers in the sub-basin.

4.2.6 Effects on Terrestrial Species

Compared to the No Action alternative, the impacts on terrestrial species from the proposed action are expected to be benign or beneficial. Because the scale of the proposed artificial propagation program is relatively small and it makes use of existing hatchery facilities for the hatching and rearing stages, additional impacts on the habitat of terrestrial organisms, ESA-listed or unlisted, compared to the No Action alternative are not anticipated to be substantial or long-lasting. There is likely to be temporary and localized displacement of some terrestrial organisms during the installation and operation of trapping facilities and during evaluation activities. The long-term benefits accruing to terrestrial piscivores and scavengers may be substantial if the project is successful in restoring the listed chinook salmon population. Excess carcasses from artificially spawned salmon would be added to the stream for nutrient enhancement and the carcasses of naturally spawned fish would also be utilized naturally within the environment.

4.2.7 Effects on Social and Economic Resources

Compared to the No Action alternative, the impacts on social and economic resources from the proposed action are expected to be beneficial. The project is designed to restore the listed population of salmon including the opportunity for non-consumptive observation of spawning salmon and the immeasurable existence value of the salmon population. If the project has long-term success the availability of salmon for ceremonial and subsistence uses by the treaty Indian

tribes would increase. Eventually, the project may contribute to self-sustaining salmon populations and surplus fish for recreational fisheries. Recreational fishing provides substantial income and important employment opportunities in remote, rural communities located in the Snake River basin.

4.2.8 Environmental Justice

Executive Order 12898 (59 FR 7629) directs Federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. As under the other alternatives considered, the Proposed Action alternative would not be expected to affect human health of any population located in the action area.

Compared to the No Action alternative, the impacts from the proposed action are expected to be beneficial. Recreational fishing provides substantial income and important employment opportunities in remote, rural communities located in the Snake River basin. Under the Proposed Action alternative, increased fishing opportunities may result as compared to the No Action alternative. These fishing opportunities would be available to all population segments. Tribal harvest and subsistence fishing opportunities, and potential opportunities for low-income persons could increase, but these communities would not be disproportionately affected compared to other communities.

4.2.9 Effects on Treaty Trust Responsibilities

The proposed action is more responsive to Treaty Trust responsibilities and policies than the No Action alternative. As explained above in subsections 1.1 and 3.9, the Federal Government has an obligation to work collaboratively with the Tribes to facilitate management of treaty trust resources. In contrast to the No Action alternative, the proposed action of issuing a section 10 permit to tribal authorities for the management of a treaty trust resource is directly responsive to Treaty Trust Doctrine.

4.3 Alternative 3 - Issue a Permit for Annual Production of 310,068 Smolts

Alternative 3 would encompass the issuance of a permit under section 10(a)(1)(A) of the ESA for a program to collect 131 pairs (232 fish) of adult chinook salmon annually from Johnson Creek and produce 310,068 hatchery-reared smolts, based on the application submitted by CRITFC. The effects of this alternative, compared to the Proposed Action and No Action alternatives, are primarily related to the larger scale of the action and the need for additional permanent facilities to trap, hold, and spawn a larger number of adult broodstock and rear and release a larger number of juvenile salmon.

4.3.1 Effects on Riparian Habitat

The effects of this alternative, compared to the proposed action and No Action alternatives, are greater, primarily because of the larger scale of the action and the need for additional facilities. The effects on riparian habitat resulting from issuing a permit which allows implementation of an artificial propagation/supplementation program producing over 300,000 smolts annually would

include impacts on riparian vegetation and terrestrial habitat during construction of adult holding and smolt acclimation facilities, potentially reducing the area's properly functioning condition. Adverse geological effects might occur, due to alteration of the flood plain and side channels, which could affect channel stability and bedload movement. Similar to the Proposed Action alternative, adverse impacts would result from maintenance and operation of the trap and weir, as project personnel walk between the trap and the tender's camp and fish truck loading area. In-stream flows would be affected by diversion into holding and acclimation facilities and discharge back to the stream. The effects on the physical environment associated with these types of activities would be managed through design criteria and, although the area subject to disturbance is several times larger than under the proposed alternative, would affect only a few acres within the Johnson Creek sub-basin. Long-term benefits are expected to occur from the increased recycling of marine nutrients through the riparian vegetation and the associated fauna.

The USFS has adopted strategies and standards for management of watersheds which support important fishery resources, including the "Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California" (PACFISH) (USDA 1995a) and "Interim Strategies for Managing Fish-producing Watersheds on Federal Lands in Eastern Oregon and Washington, Idaho, Western Montana and Portions of Nevada" (INFISH) (USDA 1995b). PACFISH is described as "an interagency ecosystem management approach for maintaining and restoring healthy, functional watersheds, riparian areas, and aquatic habitats within the range of Pacific anadromous fish on Federal lands." INFISH serves the same purpose for listed and sensitive non-anadromous fish. Both documents contain general and specific standards and strategies to protect and restore aquatic habitat in fish-bearing streams, including such measures as riparian area setbacks for construction or timber harvest and designation of Riparian Habitat Conservation Areas (RCHA). Because this alternative would require permanent construction within the RCHA of Johnson Creek, channel alteration, and diversion of flow from the stream, CRITFC would be required to show compliance with PACFISH and INFISH standards, which are part of the Forest Plan. The construction of the facility within the RHCA of Johnson Creek must be consistent with the Riparian Management Objectives. Additionally, CRITFC would need to illustrate how the proposed construction would satisfy any other applicable state and Federal regulations regarding riparian area preservation, flood plain alteration, channel protection, and water rights.

4.3.2 Effects on Water Quality

The effects of this alternative, compared to the proposed action and No Action alternatives, are primarily related to the scale of the action and the need for additional facilities. Water quality would temporarily be adversely affected during construction of fish trapping and holding facilities and an acclimation pond. Some feeding of smolts during final acclimation could negatively affect water quality. Effects on water quality related to the presence of salmonid carcasses in the water, as a result of dying after spawning, or dying during unsuccessful upstream migration, may occur. The historical amounts of nutrients available to the ecosystem from these carcasses was large, and contributed to the enhancement of many forms of aquatic and terrestrial life, including the organisms juvenile salmon feed upon during rearing. The decomposing

carcasses of spawned salmon would have temporary and local effects on water quality as nutrients are dissolved into the stream and taken up by aquatic and terrestrial flora and fauna. The over-all and long-term effects on water quality resulting from the proposed action are expected to be negligible.

4.3.3 Effects on ESA-listed Anadromous Fish

The effects of this alternative, compared to the Proposed Action and No Action alternatives, are primarily related to the scale of the action and the need for additional facilities. The effects are designed to only impact the target population of summer chinook which is native to Johnson Creek. The analysis contained in the draft opinion on issuance of Permit 1250 concludes that the release of over 300,000 smolts annually may exceed the natural carrying capacity of habitat in Johnson Creek. The return of an average of over 1,000 additional hatchery-produced adults for natural spawning each year is likely to dominate the naturally spawning component, which has averaged about 350 fish over the past 30 years, and collection of 232 naturally-produced adults for hatchery broodstock would further reduce the number of natural-origin, naturally-spawning fish in the population, placing a very high reliance on the ability of the first-generation hatchery-origin adults to successfully reproduce. A program of that magnitude could change the chinook salmon population of Johnson Creek from a naturally producing population which has shown resilience under fluctuating environmental conditions to a population which is predominantly of hatchery origin and dependant upon continued supplementation. Under these conditions, genetic and demographic effects would likely cause fundamental changes in the population's distribution and migratory behavior, though such effects could possibly be sufficiently ameliorated through careful monitoring and management of the program, as described in the application. The research described in the application, as well as use of the monitoring and evaluation data collected pursuant to this permit and permit 1134, would be critical in the on-going management of this program.

The only other listed anadromous species expected to occur in the Johnson Creek sub-basin is Snake River Basin steelhead. The native steelhead evolved with the native chinook stock and would be expected to suffer fewer impacts from the salmon supplementation program than would the target population of chinook salmon. Listed steelhead would be expected to benefit from the recycled marine nutrients added to the ecosystem by the carcasses of spawned-out salmon. However, juvenile steelhead may be displaced by the large number of chinook salmon smolts, and juvenile steelhead may be more likely to leave the freshwater areas, resulting in some displacement and the possibility of a "pulling" effect on juvenile steelhead from the large number of emigrating chinook smolts.

4.3.4 Effects on Other ESA-listed Fish Species

The effects of this alternative, compared to the proposed action and no action alternatives, are primarily related to the scale of the action and the need for additional facilities. The effects of a larger number of released smolts on bull trout could be benign or beneficial if the increased number of smolts improved forage supplies. The potential for adverse short-term displacement or competitive interaction with bull trout would be increased compared to the proposed action

and No Action alternatives. Facility construction might slightly impact bull trout, and handling of bull trout at the weir would occur, though no mortalities of bull trout would be expected (the timing of the chinook salmon trapping coincidentally reduces the likelihood of encountering other species, and trap protocols are designed to minimize stress or injury to both the target and incidental catch).

4.3.5 Effects on Non-listed Fish Species

The effects of this alternative, compared to the proposed action and No Action alternatives, are primarily related to the scale of the action and the need for additional facilities. Other resident fish species would be expected to benefit from the nutrient enrichment and the ecosystem restoration impacts which would occur concurrently with the recovery of the salmon populations. The most common native resident fish species are mountain whitefish, cutthroat trout, dace, and sculpin (see subsection 3.5). Each of these species co-evolved with chinook salmon and would be expected to benefit from the restoration of salmon in their ecosystem. These species all depend on aquatic insects for forage and the recycling of marine nutrients from spawning salmon is expected to increase insect production. Also, each of these species may utilize salmon eggs and fry as forage under some conditions. There would be some displacement and competition between the large number of salmon smolts and resident fish species. Temporary and localized displacement of fish and negative impacts on in-stream and riparian habitat related to facility construction would occur. Brook trout would be minimally affected by construction activities; they would benefit to some small extent from an increase in salmon abundance.

4.3.6 Effects on Terrestrial Species

The effects of this alternative, compared to the proposed action and no action alternatives, are primarily related to the scale of the action and the need for additional facilities. Alternative 3 would require additional adult trapping and handling facilities for broodstock collection, hatchery facilities for the hatching and rearing stages, and an acclimation pond for release of smolts. Therefore, adverse impacts on terrestrial organisms, ESA-listed or unlisted, would be expected to be greater than under the proposed action or No Action alternatives. This alternative still would only affect a few acres and, except for displacement during construction activities, the impacts on terrestrial species would not be substantial. Permanent construction and alteration of the flood plain would be a long-lasting impact. The long-term benefits accruing to terrestrial piscivores and scavengers may be substantial if the project is successful in restoring the listed chinook salmon population. Excess carcasses from artificially spawned salmon would be added to the stream and the carcasses of naturally spawned fish would also be utilized naturally within the environment.

4.3.7 Effects on Social and Economic Resources

The effects of this alternative, compared to the proposed action and No Action alternatives, are primarily related to the scale of the action and the need for additional facilities. The principal, short-term impact of the JCAPE project at the 310,000 smolt production level would be to restore the opportunity for non-consumptive observation of spawning salmon and the immeasurable existence value of the salmon population. There is a likelihood equal to or greater

than under the proposed action that production at this level would result in a near-term restoration of opportunities for ceremonial and subsistence uses by the treaty Indian tribes and surplus fish for recreational fisheries. The availability of salmon for ceremonial and subsistence uses by the treaty Indian tribes would increase (under the No Action alternative availability would not increase), and would possibly increase more quickly than under the proposed action alternatives. As with the proposed action alternative, the project is expected to contribute to self-sustaining salmon populations and surplus fish for recreational fisheries.

4.3.8 Environmental Justice

Executive Order 12898 (59 FR 7629) directs Federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. As under the No Action alternative, this alternative would not be expected to affect human health of any population located in the action area.

The effects of this alternative, compared to the proposed action and No Action alternatives, are primarily related to the scale of the action and the need for additional facilities. Under this alternative, increased fishing opportunities may result as compared to the other alternatives. These fishing opportunities would be available to all population segments. Tribal harvest and subsistence fishing opportunities, and potential opportunities for low-income persons could increase, but these communities would not be disproportionately affected compared to other communities.

4.3.9 Effects on Treaty Trust Responsibilities

The proposed action is more responsive to Treaty Trust responsibilities and policies than under the No Action alternative. As explained above in sections 1.1 and 3.9, the Federal Government has an obligation to work collaboratively with the Tribes to facilitate management of treaty trust resources. The proposed action of issuing a section 10 permit to Tribal authorities for the management of a treaty trust resource is directly responsive to Treaty Trust Doctrine.

5.0 Cumulative Impacts

Cumulative impacts of NMFS' current proposed action are expected to be minor. Outside of the immediate action area they would not be measurable. Within the action area, there are expected to be beneficial effects on the biological and human environments associated with the restoration of important natural resources. Incremental impacts on the environment are included in the discussion above. Issuance of section 10 permits for direct take of listed salmon for research and enhancement purposes is only one element of a large suite of regulations and environmental factors which may influence the overall management of fishery actions in the affected environment, and which may impact the health of listed salmon populations and their habitat. The proposed tribal program is coordinated with monitoring and adaptive management measures so that fishery managers can respond to changes in the status of affected listed salmon.

Monitoring and adaptive management would help ensure that the affected ESUs are adequately protected and help counter-balance any negative cumulative impacts.

Other Federal, state, and tribal actions are expected to occur within or near the action area which would increase fish populations in the Columbia River basin. Federal actions for salmon recovery in the Columbia River basin which are currently underway include initiatives by the Northwest Power and Conservation Council. State initiatives include recently passed legislative measures to facilitate the recovery of listed species and their habitats, as well as the overall health of watersheds and ecosystems. Regional programs are being developed which designate priority watersheds and facilitate the development of the watershed management plans. Tribes have developed a joint restoration plan for anadromous fish in the Columbia River basin, known as the Wy-Kan-Ush-Mi Wa-Kish-Wit or Spirit of the Salmon plan. These planning efforts, in conjunction with the proposed action, are expected to help increase salmon and steelhead populations in the action area because of compatible goals and objectives. A healthy and self-sustaining summer chinook salmon population in Johnson Creek would be an important component in long-term recovery of the ESU as a whole.

6.0 Agencies Consulted

National Marine Fisheries Service
U.S. Fish and Wildlife Service
Idaho Department of Fish and Game
U.S. Forest Service
Nez Perce Tribe

7.0 References

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